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ABSTRACT

One of the ways in which children of depressed parents are affected is in the area of cognitive schemata. In cognitive behavioral theory, schemata drive emotions and therefore influence behavior. Subsequently, a better understanding of the cognitive schemata of children of depressed parents is attempted in this paper. It offers a review of the theoretical literature on schema development, empirical literature on children of depressed parents, discusses the intersection of the two, and how research and theory influence each other. Most of the research here focuses on children from the ages of birth through four years old. Results indicate that the parenting process is truncated by depression in either parent, affecting the child's attachment and influencing the development of cognitive schemata of the child. Some of the other factors that affect the development of cognitive schemata of children of depressed parents included the child's own brain activity and the relational environment of the home where the child lives. It seems that children of depressed parents are forced into self-sufficiency beyond their capabilities, and so they experience a sense of failure before they are capable of processing disappointment. Fear also plays a large role in their cognitive schemata. (RJM)

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**THE DEVELOPMENT OF COGNITIVE SCHEMATA IN
CHILDREN (BIRTH TO 12 YEARS OLD) OF
DEPRESSED PARENTS: A REVIEW
OF THE LITERATURE**

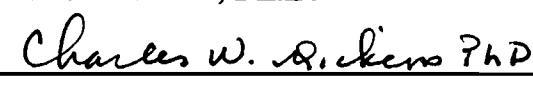
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DEPRESSED PARENTS: A REVIEW
OF THE LITERATURE**

A Doctoral Research Paper

Presented to

the Faculty of the Rosemead School of Psychology

Biola University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

by

Dean John Barrett

May, 1997

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ABSTRACT

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by

Dean John Barrett

Cognitive schema theory is reviewed with respect to Piaget and developmental psychology. In addition, cognitive schema theory according to Guidano and Liotti's, and Epstein's models of personality are reviewed. Similarities and convergencies are drawn and applied to the research on children of depressed parents. The parenting process is shown to be truncated by depression in either parent, which affects the child's attachment which in turn impacts the development of cognitive schemata of the child. Other factors that influence the development of cognitive schemata of children of depressed parents include the child's own brain activity and the relational environment of the home where the child lives. Children of depressed parents appear to be forced into self-sufficiency beyond their capabilities, and therefore they experience a sense of failure before they are capable of processing disappointment by themselves. The cognitive schemata of children of depressed parents appear to be predominantly fear-based.

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**THE DEVELOPMENT OF COGNITIVE SCHEMATA IN
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DEPRESSED PARENTS: A REVIEW
OF THE LITERATURE**

Introduction

Children of depressed parents have been researched extensively for the past 30 years. In 1966 Michael Rutter conducted seminal research on mentally ill parents and their children. One thing he found that was considered remarkable at that time was that the symptoms of children did not mirror those of their disturbed parents. In other words, if the parent was depressed or schizophrenic, the child did not necessarily show similar symptoms. Research since that time has been mixed, sometimes showing a correlation between parent and child symptomatology and sometimes not. Often children of depressed parents suffer from ailments besides depression which include physical illnesses, impulse control problems, and psychiatric dysfunctions (Downey & Coyne, 1990). Regardless of the diagnosis, it appears that parental depression influences a child's well being in important and often negative ways.

One of the ways in which children of depressed parents are affected is in the area of cognitive schemata (Hammen, 1988). According to cognitive

behavioral theory, schemata drive emotions (Beck, Rush, Shaw, & Emery, 1979; Meichenbaum, 1977; Young, 1994) and therefore influence behavior. Therefore a better understanding of the cognitive schemata of children of depressed parents will help researchers, theorists, and clinicians discern the needs of these children and also may help professionals treat adult children of depressed parents.

Since Rutter's (1966) initial research, other developmental researchers have uncovered many characteristics of children of depressed parents indicating that the children are at risk for developing some kind of psychopathology. These characteristics include weight problems and other physical ailments, poor coping skills, relational difficulties such as shyness and the inability to maintain friendships with peers (Kochanska, 1991; Rutter, Izard, & Read, 1986), and a tendency to become depressed themselves at some point in their lives (Beardslee, Bemporad, Keller, & Klerman, 1983; Billings & Moos, 1985; Hammen, Burge, & Adrian, 1991).

From a clinical perspective, cognitively oriented clinicians attribute emotional difficulties and behavior problems to a person's underlying schemata (Beck et al., 1979; Meichenbaum, 1977; Young, 1994). If schemata are what drive emotions, then it is peculiar that there is such a dearth of studies establishing the connection between the cognitive schemata of children of depressed parents and the children's behavior problems. Jaenicke et al. (1987) and Hammen (1988) have published two such studies, but there

are not many others.

While the development of cognitive schemata may be difficult to measure, a harmonious theory of cognitive development would be helpful because it would enable clinicians and researchers to better organize and apply their knowledge. The importance of the concept of schema development is not just for those who practice cognitive psychology or adhere to a cognitive-behavioral approach to psychotherapy; it is important for anyone interested in mental health and the development of the self. Theorists and practitioners from a variety of different modalities stand to benefit a great deal from this understanding.

The purpose of this paper is to review theoretical literature on schema development, empirical literature on children of depressed parents, discuss the intersection of the two, and show how research and theory are influencing each other. Because parental relationships are important to the development of cognitive schemata, the majority of this paper will focus on children from the ages of birth through 4 years old.

Methodological Considerations

There are many definitional issues involved in the investigation of such a concept as schema theory. Likewise there are some methodological considerations impinging upon the interpretation of the research on children of depressed parents. The points of overlap and intersection are few, and yet

not infeasible. In the research on children of depressed parents, things such as selection, measurement of depression, attachment, and extraneous variables must be evaluated. The first thing that must be considered is a definition of schemata.

Schemata

Due to the fact that schemata are not physical objects, they are difficult to measure. They are similar to concepts such as intelligence, creativity, and instincts in that they refer to something that does not necessarily exist in space and they are inferred from observable behavior (Wadsworth, 1996).

Although the form and function of cognitive schemata are not fully understood (Hammen, 1988), there are instruments that measure cognitive operations. The Piers-Harris Self-Concept and a modification of an incidental memory task are the two primary means by which schemata are measured (Hammen; Jaenicke et al., 1987). The Piers-Harris test is an attempt to measure overall self-worth. It contains 80 true-false items and has been used with children up to 18 years of age. It has been shown to have a high level of internal consistency reliability, good test-retest reliability, and good construct validity (Jaenicke et al.).

The incidental memory task used by Jaenicke et al. (1987) and Hammen (1988) was adapted from similar instruments used to measure cognitions in adults. It is based on the hypothesis that a self-schema is

contained in the memory which guides and selects the encoding and retrieval of information about the self. The procedure consists of 22 positive and 22 negative self descriptive adjectives. Children are asked to check "yes" or "no" after each statement. After they finish they are unexpectedly asked to remember as many words as possible from the questions. The theory is that the child will remember those adjectives consistent with his or her schema. The score is generated by the ratio of negative words to positive words remembered. The reliability and validity of this test are unknown, but it is a creative attempt to measure such an elusive topic.

Various psychological perspectives discuss cognitive schemata development in different ways. For example, developmental psychologists view schema development as a stage by stage process in which each stage must be completed before entering the next. In contrast, cognitive clinicians view schema development more as schema maintenance where a person's beliefs and convictions are held and verified. In order to clear up potential confusion, and in hopes of coming to an integrated understanding of the terms, schemata will be discussed from both a developmental and clinical perspective.

Depression

Depressed parents were originally used as a control group for the study of schizophrenic parents (Downey & Coyne, 1990). The findings on the depressed parents control group were so remarkable that the control group

itself became the focus of investigation and the schizophrenic parents then became the control group. This was a problem because depressed parents were not measured against normal parents. It has only been in the past five years that research on depressed parents has been conducted using non-ill control groups, and, to date, the studies are few.

In addition to the small pool of studies on depressed parents using a non-ill control group, there is the problem of how the depressed parents are recruited. Depressed parents are generally recruited through their therapists or through newspaper advertisements. Parents who respond to the advertisements may be at a point where they feel the need to get help. They would be quite different from parents who were depressed but did not see the need for change. One of the major features of depression is a decrease of energy and interest in almost all activities of the day, including reading the newspaper; therefore, severely depressed individuals may not even respond to the prompt. In addition, depression has been correlated with environmental factors such as poverty and unemployment, so the samples may at times be dominated by people from lower socioeconomic backgrounds (Kochanska, 1991; Teti, Gelfand, Messinger, & Isabella, 1995). This calls into question the generalizability of the results to the wider population of depressed parents.

One of the most critical factors in the methodology of the research is the measurement of depression in the parent. Levels of depression in the

parent may affect the children in different ways, so it is important to get an accurate description of the depressive symptoms. Many researchers rely on self-reports such as the Beck Depression Inventory (BDI) and the Center for Epidemiological Studies-Depression Scale (CES-D). Self reports allow the subjects to give an organized description of their symptoms. They work best when used with other diagnostic tools such as the clinical interview.

The BDI was shown to have high internal consistency in both psychiatric and non-psychiatric settings. With respect to other measures of depression, the BDI has strong content, concurrent, discriminant, construct, and factorial validity. It appears to be a reliable instrument in the measurement of depression (Beck, Steer, & Garbin, 1988). The BDI is a 20-item scale on which clinically depressed individuals have been found to score at or above 16, but it is not a measure of clinical depression. It is only an instrument which implies depression (Weissman, Sholomskas, Pottenger, Prusott, & Loche, 1977).

A good means of determining levels of clinical depression is the direct clinical interview. When the clinical interview is conducted by an experienced clinician who is familiar with the diagnostic criteria, it provides a more accurate account of the severity of the depression than when the interview is done by graduate students. The Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robbins, 1978) assist clinicians in getting an accurate diagnosis of depression and are used by researchers to place subjects in appropriate

test groups. However, the RDC is based on the Diagnostic and Statistical Manual of Mental Disorders (second edition; DSM-II; American Psychiatric Association [APA], 1968) and has not yet been updated to coincide with the DSM-IV (APA, 1994).

Attachment

Attachment is an important factor in the development of cognitive schemata because it is one of the foundations from which mental pictures emerge (Epstein, 1991; Guidano & Liotti, 1983). The Strange Situation paradigm is generally the measure of choice to evaluate attachment between children (under 21 months) and their mothers (Teti et al., 1995). It is a 7-episode procedure that classifies attachment styles in the following ways: (a) type A, which is an insecure-avoidant attachment; (b) type B, which is a secure attachment; (c) type C, which is an insecure-ambivalent attachment; and (d) type D, which is a disorganized-disoriented attachment.

The Preschool Assessment of Attachment (PAA) is a modification of the Strange Situation paradigm used to measure attachment in preschool children over the age of 21 months (Teti et al., 1995). As with the Strange Situation, children and their mothers are observed and rated according to the quality of their attachment. In the PAA, however, there are six potential categories of attachment: (a) type A, defended; (b) type B, secure; (c) type C, coercive; (d) type A-C, defended coercive; (e) type A-D, anxious depressed; and (f) type I-O, insecure other. These two instruments are quite similar except

that the internal and external validity is not as strong in the PAA (Teti et al.).

The environment of a depressed person is usually such that it is difficult to control variables such as marital discord, the condition of the health of a spouse, the impact of poverty, the well-being of siblings, or the personality of the parent. Each of these makes it difficult to isolate and measure the direct impact of a parent's depression on his or her children.

Cognitive Schemata and Developmental Psychology

There are many developmental theories which attempt to explain how children learn and mature. Most of the theories revolve around one of two ends of a spectrum. At one end of the spectrum are theories which state that information is poured into the child's mind from the environment. At the other end of the spectrum are theories which state that children construct their own knowledge. Piaget held a theory which fell in the latter category.

Piagetian Theory

The idea of a mental picture influencing one's behavior and vice versa has occurred since the time of Plato. It was further elaborated by the philosopher Immanuel Kant (Neimeyer, 1993). However, the introduction of the general concept of cognitive schemata in modern psychology is typically attributed to Jean Piaget. As a developmental psychologist, Piaget attempted to demonstrate the manner in which schemata form within the

minds of human beings. He also sought to show how schemata influence the development of the learning processes in children from birth through adolescence (Wadsworth, 1996).

Piaget believed that psychology was the intersection of biology and epistemology. Therefore, he sought to discover and document a specific course by which the development of knowledge evolves as the human organism progresses from infancy through adolescence. While he formulated numerous revolutionary ideas throughout his writings, there are three primary concepts that are important to the illumination of the development of cognitive schemata in children of depressed parents: "structuralism," the process of "assimilation and accommodation," and his well known "developmental stages."

Whereas a mechanist believes knowledge is acquired passively through the senses, a structuralist's view of knowledge acquisition is that the child uses innate structures to construct the consciousness. Learning is an active process by which the child interacts with the environment (Neimeyer, 1993). With the hope of ascertaining an ideal innate cognitive structure, Piaget (1970) defined cognitive structure as a system of transformations. In addition, he believed that despite their diversity, mental structures (schemata) all have certain common laws that govern their operation.

Piaget (1970) suggested that the mind is made up of many structures (schemata) analogous to that of the system of integers. In the system of

integers there are many different groups of numbers and interplays between numbers, and there are certain laws that regulate their exchanges. With his commitment to a mathematical understanding of structure and his early training as a biologist, Piaget sought to understand the manner in which organisms relate to and interact with their environment (Wadsworth, 1996). He was also interested in finding out just how these mental structures reach a mature level of functioning. While he believed these structures were innate, he also saw the mind as being like a living organism, always working to form and expand its capabilities (Piaget, 1970).

The idea of structures is one of the hallmarks of Piagetian theory (Halford, 1989). Structures are internal and self-regulating; they control thinking. This means that something can be learned if it can fit into an existing structure. If there is not an existing structure, then learning cannot take place.

Assimilation and accommodation, according to Piaget, is the process through which cognitive structures develop and expand (i.e., the learning process). As a child encounters the world, he or she assimilates the information into existing categories. A structure changes by way of accommodation. Accommodation is the metamorphosis or modification of existing structures, or the creation of a new one to incorporate new stimuli (Wadsworth, 1996).

Piaget hypothesized that cognitive structures (schemas) develop

through a series of four major stages: the sensorimotor stage, preoperational thought, concrete operations, and formal operations. Each stage has its own characteristics and uniquenesses.

In the sensorimotor stage the child's intellectual development moves from the physical realm to the mental realm. At birth the infant does not have the capacity for mental life. Knowledge at this point is physical; that is, a child can only feel and experience objects. He or she cannot think about objects or understand the purpose or meaning of them. For example, a child under the age of two can only play with toys, not understand the rules for using a toy (Duska & Whelan, 1975).

At the beginning of this stage, the child is in an undifferentiated state. In mind, he or she is not different from the environment, and wishes are equal to reality. The child is fully "centered" on self. Development in this stage is a process of "decentration." Schemata are simply a group of unconnected pictures that come and go but do not remain because object permanence has not yet been attained. Toward the end of this stage, mental connections can be made and object permanence is attained (Ginsburg & Opper, 1988).

As the child moves into the second stage, preoperational thought, schemata are now established. The child has the mental ability to represent objects (Wadsworth, 1996); in other words, even when the child cannot see, hear, smell, or touch the object, he or she still knows it exists. Behavior demonstrates belief in the unseen.

Behavior also demonstrates an awareness of pleasure and non-pleasure. Pleasure is important to schema development in the second stage. It helps children develop beliefs about certain people and certain situations. How a young child feels about the environment will eventually influence how he or she thinks and feels about him- or herself. Children at this age are still egocentric, and social pleasure is not derived so much from interacting with others as it is from just acting. For example, when more than one 3-year-old is playing, each one is playing independently. At this stage the child is not yet completely differentiated from the external world (Duska & Whelan, 1975).

So, at this developmental stage, schemata are self-focused and also are beginning to broaden. If children do not fully move out of this stage, they will be more likely to interpret events as subjective statements about self, rather than being objective in the evaluation and interpretation of circumstances. If this pattern of thinking continues into adulthood, the person will be constantly depending on the external environment for a sense of self-definition.

The third stage is the stage of concrete operations. From approximately age 7 to 11, the child's reasoning capacities become more logical (Wadsworth, 1996). The child now sees rules as necessary for governing social activity and is becoming less egocentric in play, but is still self centered in many ways. This child uses logical thought processes to solve

concrete problems. The implication for schema development from the concrete operations stage seems to be that a child's ability to interpret the environment and make mental representations is limited to the immediate situation. Children in the concrete operations stage also order and classify events and things more broadly than preoperational children. For example, if a child in the concrete operational stage is presented with a collection of red and blue beads, he or she will be able to categorize them into their appropriate colors and keep in mind that red and blue beads are both part of the general category of beads (Ginsburg & Opper, 1988).

The final stage of cognitive development is that of formal operations, which begins at about age 12 and continues through adolescence. At this stage, thought is characterized by hypothesis testing and building as well as a greater understanding of causation. The adolescent has the ability to think about not only the concrete world but also the abstract world (Wadsworth, 1996). The mental pictures of things, people and places, and the rules and guidelines for behavior that make up schemata gradually begin to represent the abstract – the “not yet,” or “what if.”

During adolescence, individuals are more autonomous in thought. They can distinguish more effectively between reality and imagination. An adolescent has mentally evolved from feeling at one with the universe to being mentally differentiated and has the ability to make choices about a variety of options and potential options. Cognitive schemata can be seen as the mental

building blocks that give the adolescent this ability.

Piaget's work in the area of cognitive development is highly beneficial to the research and the theoretical understanding of the development of cognitive schemata. While it does not provide the ultimate and final definition of what schemata are and how they come to be, it is an excellent starting point for a further examination of the subject.

Script Theory

While Piaget had many influential ideas in developmental psychology, and though his legacy is great, the field has many other paradigms for viewing development. Contemporary developmental psychologists conceptualize schemata in terms of scripts. According to Santrock and Siegler (1996), "a script is a schema that focuses on the order of a predictable series of events" (p. 250). In other words, a script is like a rough draft of events or interactions that regulates how individuals anticipate, see, and interpret situations. In contrast to Piaget, script theory explains the mind as being like a computer with software that contains rules and guidelines about the way things are supposed to be. It is unclear in script theory whether the mental capacity for scripts is present from birth or is acquired from experience.

While Piaget and other developmental theorists address the acquisition of knowledge and the process by which it unfolds, they do not directly address an individual's self schema or how and why an individual comes to view self in a particular way. Script theory does. It takes into

account the importance of an individual's understanding his or her role in events. In the study of children of depressed parents, self schemata, or the way people see themselves, are important because they are closely related to psychopathology (Hammen, 1988; Jaenicki et al., 1987). The organization and functioning of self schemata are similar to those of other cognitive schemata discussed by Piaget, and to the organization and functioning of the scripts of contemporary developmentalists. The difference between self schemata and other cognitive schemata is mainly in content and focus. The primary subject of a person's self schema is himself or herself, while the focus of other cognitive schemata varies from categorizing things in the material world to differentiating ideas.

Cognitive Schemata and Clinical Psychology

According to Beck (1967), schemata are mental configurations used for appraising stimuli with which the individual comes in contact. They are responsible for assimilating and accommodating new information individuals interact with in the environment. The difference between Beck and Piaget is that Beck emphasizes one's personal beliefs about self that arise out of contact and experience with the environment, while Piaget emphasizes the process of rational thought for assimilating new information. Piaget did not directly address an individual's schema of self.

When using the term schema, however, both Beck and Piaget appear to

be referring to experiential knowledge: a type of knowing that is acquired through the senses, as opposed to knowing that comes strictly through logic. Cognitive structures are mental tools used by individuals to construct personal meaning from their interaction with the environment.

According to Meichenbaum (1977), cognitive schemata are the organizing dimensions of thinking that govern, monitor, or direct the choice of thoughts and behaviors in which humans engage. Schemata are the structures by which knowledge of the self is constructed. This is similar to the theories of other clinicians (Beck, 1967; Young, 1994) who see schemata as the mental governors of emotions and behaviors. The issue now left to address is how self schemata and self scripts materialize and how they are connected with an individual's psychopathology or lack thereof.

Guidano and Liotti

In order to further understand the process by which self schemata form, a distinction between different types of knowledge is needed. This subtle nuance is important to grasp because it is easy to view schemata as simply preconscious thoughts, rational beliefs, or "self talk" (Bernard, 1981). Guidano and Liotti (1983) have helped to clarify this by using the terms "tacit" and "explicit" knowledge. Tacit knowledge is the type of knowledge that comes first from initial contact with another object or organism (Polanyi, 1968). It results from an individual's having direct, experiential contact with the environment, and it ensues immediately. This is the first type of

knowledge that a human being acquires.

Explicit knowledge is the knowledge that results from interpreting and reflecting on tacit knowledge. It comes about gradually over time and from many different contexts. Guidano and Liotti (1983) hypothesized that explicit knowledge is somewhat limited to immediate situations. It is the initial thought or interpretation following the contact, but these thoughts accumulate over time.

The acquisition of both tacit and explicit knowledge occurs via the processes of accommodation and assimilation: The child has many different and new experiences which are assimilated as tacit knowledge. As development progresses, assimilation and accommodation yield more sophisticated organizations (i.e., higher order schemata) that allow reflection on the tacit knowledge — explicit knowledge.

Guidano and Liotti (1983) drew on the works of metaphysical philosophers and critics of scientific theory in their attempt to formulate cognitive theory of human development. They described humans as having three different layers which can be understood in terms of concentric circles (see Figure 1). At the core of the human being is a metaphysical hard-core. This is the area of tacit self knowledge. It is a structure that runs deep into the memory and is progressively elaborated upon over the lifespan. This is where an individual holds a general view of self and a deep set of rules which are used to direct and guide different aspects of mental processing.

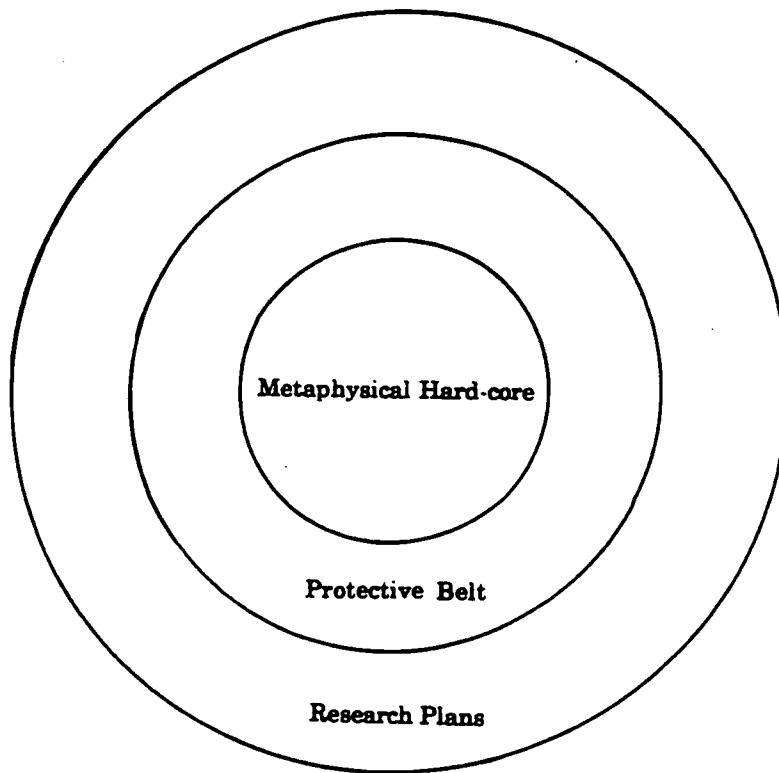


Figure 1. A diagram of Guidano and Liotti's theory of personality.

The metaphysical hard-core forms the nucleus of the individual's cognitive development (Guidano & Liotti, 1983). The rules of the metaphysical hard-core are the most basic presuppositions a person holds. They govern the way in which the individual looks at the world and interprets what he or she sees. They serve as a guide for searching out and discovering information about the self and the environment. The metaphysical hard-core directs and integrates most of an individual's affective and psychological life (Guidano & Liotti). The metaphysical hard-core is similar to Piaget's cognitive structures, but the focus here is on the self and relational

experiences rather than the development of knowledge about the external world. The metaphysical hard-core is the foundation on which the other layers of experience are established.

The second layer in Guidano and Liotti's (1983) theory of cognitive development is the protective belt. This arises out of the rules of the metaphysical hard-core that regulate the organization of new information. The protective belt parallels accessible aspects of the mind such as personal identity (McAdams, 1993). Personal identity is made up of two components: self-identity and self-esteem. Self-identity is the definition one gives to oneself resulting from the numerous interactions and experiences with and in the environment. Self-esteem is the value that one places on oneself. Personal identity is constructed by a person in response to interaction with the environment. It is constantly being modified by continuous feedback.

The third layer in Guidano and Liotti's (1983) system is the area of research plans. This is the domain where self-assumptions and self-beliefs are proved or disproved. It is where beliefs become choices and actions.

By way of summary, in Guidano and Liotti's model an individual interacts with the environment and derives some kind of tacit knowledge and then interprets and elaborates on the tacit knowledge through the organization of explicit knowledge. Then the person lives out that knowledge. Cognitive schemata appear to be the intersection of tacit and explicit knowledge.

An individual brings schemata to the relational environment. Through contact with the environment, knowledge is elaborated upon and worked into the script. For example, if the relational environment is characterized by pain, the child will likely develop schemata with personalized reasons for the pain. He or she will then make behavioral choices (research plans) based on pain and beliefs.

Cognitive-Experiential Self-Theory

Another clinical psychologist, Epstein (1991), developed Cognitive-Experiential Self-Theory (CEST). This theory corresponds with the concepts of Guidano and Liotti (1983) and helps clarify the process by which cognitive schemata develop. In a model similar to the concentric circles of Guidano and Liotti, Epstein (1991, 1994) presents a layered perspective of consciousness (see Figure 2). Accordingly, there are three “conceptual systems.” The bottom layer or first conceptual system is the “associationistic system” or “unconscious.” This dimension of the mind is similar to Freud’s view of the unconscious and Jung’s view of the “collective unconscious” in that it operates according to the rules of “primary process,” which are not based on deductive or inductive logic but on subjective feelings. The middle layer or system is the “experiential system” or “preconscious.” The experiential system also operates according to the rules of primary process and serves as the main focus of CEST. The third layer is the “rational system” or “conscious” dimension of the mind.

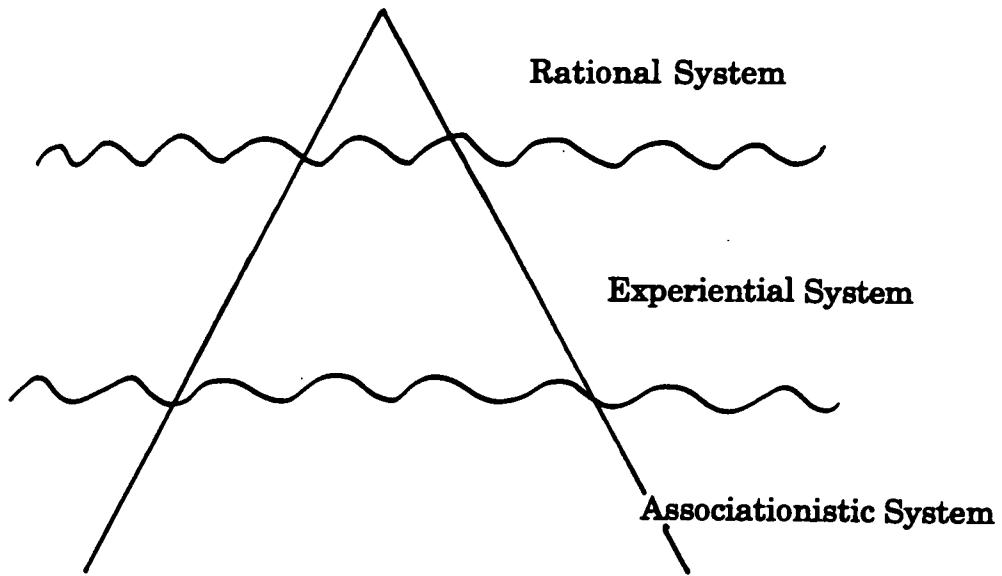


Figure 2. A Drawing of Epstein's Model of Personality.

Epstein (1993) places schemata in the second layer, the experiential system. At this level people develop an implicit theory of reality that contains subdivisions of a self-theory, a world theory, and propositions connecting the two. Epstein's view is that people form a personal theory of reality which is a hierarchically organized set of schemata and networks of schemata. These schemata organize the details of experience and also direct behavior.

There are two kinds of schemata in Epstein's (1993) model: "descriptive" and "motivational." Descriptive schemata are made up of

beliefs about what the self and world are like: to what degree is the world benign or malevolent? Meaningful or chaotic? To what degree are others a source of support and happiness, or insecurity and unhappiness? How lovable and good, or unlovable and bad am I?

Motivational schemata are beliefs about what has to be done to acquire what is desired and avoid what is disliked. Epstein (1991) wrote that motivational schemata are deduced primarily from emotionally significant experiences and are thus emotionally enlivened. Both types of schemata occur at various levels of the experiential system.

As stated earlier, the experiential system is a preconscious system. Compared to the third, or top, layer in Epstein's model, the experiential system is a more natural system in that it has a strong biological component, and knowledge on this level does not operate according to the rules of logic (Epstein, 1991). The emotions and cognitions in this cognitive dimension are a result of direct experiences with the environment. Knowledge is acquired directly and immediately. This is similar to Polanyi's (1968) concept of tacit knowledge and Guidano and Liotti's (1983) concept of the metaphysical hard-core. The experiential system is a holistic, emotional, and pleasure-pain oriented network. Reality is encoded in concrete images and metaphors as opposed to abstract symbols (words and numbers) as in the rational system. Additionally, the experiential system is relatively slow to change and can only do so with repetitive experience. Experience in this mode is passive — one is

controlled and driven by his or her emotions. This seems to be a mode that is more reactionary than Piaget's stages of cognitive development, which is scrupulous and deliberate in its process of knowledge expansion.

In contrast to the experiential system, the rational system is more analytic and reason sensitive. Knowledge acquisition and behavior in this system are based on delayed reaction and delayed gratification by having an experience followed by a pause to think and decide what to do. Change in this mode of experience can occur with a shift of thought. Experience in the rational system is active and conscious and it requires logic and evidence (Epstein, 1991).

The experiential and rational systems are the two primary modes by which individuals adapt to the world. Schemata fit in as the building blocks of a person's theory of reality (Epstein, 1994). According to Epstein (1991, 1994) schemata are derived from emotionally charged past experiences and are organized in an inter-connected matrix, not simply isolated from each other. Thus one schema will affect and be affected by another.

The main environment in which the experiential system is developed is interpersonal relationship. Since schemata development emerges from a relational context, children of depressed parents have a unique challenge. Having a depressed parent does not cause a sudden, drastic change in the relationship, but instead, there is a continuous manner of moderate disengagement between parent and child (Stern, 1995). By having to contend

with a parent who is depressed, the child must deal with a relational environment that is often unsupportive. And, while the mother may be present physically, the child must continually grapple with her psychological and emotional absences. Therefore inconsistency in the maternal relationship causes the child's schemata to develop in the context of mild to severe adversity. Schemata are filled with memories of negative experiences and interpretations of those events. This experience is not, however, exactly the same for every child. Parental depression will affect children differently according to their stage of development and the onset and chronicity of the parent's depression.

Infants and Toddlers

An evaluation of the impact of parental depression on children must consider many factors, such as the relational environment of the children, parenting behavior, and the child's own genetic composition. Studies of the brain activity of children of depressed parents are helpful because they clarify physiological differences. Attachment is another important factor because the type of attachment between infant and mother affects schemata development. Finally, emotional patterns in children of depressed parents must be considered because feelings reflect the tacit knowledge and the experiential system of children of depressed parents.

Parenting Behavior

Parke, MacDonald, Beitel, and Bhavnagri (1988) have cited three main ways parents influence their children: one-on-one interaction, coaching, and managing the child's social activities. Each of these parental influences plays an important role in the development of children. Parental depression may interfere in these tasks, leaving the child isolated in his or her cognitive, social, and emotional development.

The family provides crucial relational experiences which are foundational for schema growth and development. It also provides the context in which a child's strongest emotional ties are formed and the stage on which his or her most intense personal experiences are enacted (Rutter, 1966). Major depression often brings about rampant and sometimes injurious changes in the home (Rutter, 1966). When a family contains a depressed parent there is a unique interpersonal context involving a physically present, but emotionally absent parent. Children must contend with this by using coping skills that are not fully developed (Downey & Coyne, 1990).

Davenport, Zahn-Waxler, Adland, and Mayfield (1984) studied the early child-rearing practices of families with a manic-depressed parent. This study demonstrated some of the ways that a depressed parent's one-on-one interaction is different from a non-depressed parent's. They selected subjects who had been inpatients at the National Institute of Mental Health (NIMH).

Of the 7 parents, 4 were women and 3 were men. All 7 of the infants were males. Seven male control infants were selected that were similar in age, parent's age, social class, race, and education, but without parental depression.

All the families were observed separately in a laboratory playroom when the children were 12, 15, and 18 months of age. A Block Q Sort was used to examine the values, methods, and philosophies used by the parents in raising their children. It was administered when the children were 24 months old. A Block Q Sort is a forced-choice interview. There are 91 cards, each containing a sentence on child-rearing, such as, "I believe in spanking" (not a real example). The parent was required to sort these cards into seven piles, each of which contained 13 cards, and then rank the cards.

The mean scores on block items that were significant were mother's encouragement of the child to try new experiences ($M = 5.61$ vs. $M = 6.21$, $p < .02$), negative affect toward child ($M = 2.9$ vs. $M = 2.03$, $p < .05$), mother's open expression of affect ($M = 5.86$ vs. $M = 6.44$, $p < .005$), protectiveness of child ($M = 3.10$ vs. $M = 2.42$, $p < .05$), and teaching children to control feelings ($M = 2.57$ vs. $M = 1.35$, $p < .01$).

These results indicated that one-on-one interaction between a child and his or her depressed parent was disrupted by the depressed parent's need for self-validation based on the child's performance (Davenport et al., 1984). The results of this study also imply that a child of a depressed parent may

live in an emotionally impoverished environment where the focus is on making the parent feel more valuable and worthwhile rather than on what the child needs. However, because the study involved only 7 subjects, the results lack statistical power. A larger sample population would allow the results to be stated more strongly. In addition, the subjects were largely bipolar, so the results may not be purely a measurement of the impact of depression on children, even though many of the subjects were depressed at the time. Also, this study failed to report the current depressive symptoms or how long ago the subjects had been hospitalized.

Field, Healy, Goldstein, and Guthertz (1990) also investigated how depressed parents' interactions with their children differ from those of non-depressed parents. The researchers assessed 24 depressed and 24 non-depressed mother-infant dyads when the infants were 3 months old ($M = 3.4$). The mothers were recruited from a university clinic. They were administered the BDI and put in either the depressed group or the control group, based solely on elevated BDI scores (BDI > 12 were classified as depressed). The average score in the nondepressed group was 3.7, and in the depressed group it was 19.8. Six subjects were excluded from the experiment because their scores fell between 9 and 12.

The mothers and their children were filmed in face-to-face interactions, then the mothers were interviewed. The behavior of the mother was monitored during the film and was coded according to four behavior states:

(a) anger/poke, which meant a mother was handling or speaking to her child in a grossly angry way, or was roughly pulling or poking in order to control the child; (b) disengaged, which meant the mother simply did not interact with the child, or related with a flat affect; (c) elicit, which meant the mother was constantly trying to get the child's attention by using finger-snapping or sudden movements; and (d) play, which included all instances of positive behavior, such as smiling, cooing, and singing.

The children were monitored for several behaviors: protest, attend, look away, and play. "Protest" was a negative affect expression like grimacing or crying. "Attend" referred to a neutral affect state in which the infant looks at the mother with an open expression. "Look away" referred to a slightly negative expression with the infant's gaze directed away from the mother. "Play" referred to a positive facial expression with the infant's gaze directed toward the mother.

The study found that, compared to the non-depressed controls, the depressed mothers spent more time in the anger/poke state (21% vs. 3%, $F = 10.19$, $p < .005$) and the disengaged state (22% vs. 2%, $F = 12.62$, $p < .001$), the same amount of time in the elicit state (44% vs. 35%, ns), and less time in the play state (13% vs. 61%, $F = 43.52$, $p < .0001$). The infants of the depressed mothers spent more time in the protest state (38% vs. 9%, $F = 18.68$, $p < .0001$), the same amount of time in the look away (26% vs. 18%, ns), and attend (25% vs. 32%, ns) states, and less time in the play state (11%

vs. 42%, $F = 20.30$, $p < .0001$).

Theoretically speaking, when a child perseverates in the protest state he or she could be attempting to get the mother's attention. If the child does not feel heard by the mother, he or she may attempt to get her attention in more hostile ways. This could leave the child feeling powerless in the relationship and then resigned to accept not being heard. As the child gets older, the attitude could generalize to other people and situations and even affect the way in which the child views self.

As for the mother and child relationship, the study found that the depressed dyads spent more time in the anger-poke/protest state (14% vs. 2%, $F = 9.48$, $p < .005$) and the disengaged/look away state (8% vs. 0%, $F = 8.91$, $p < .005$), the same amount of time in the elicit/attend state (14% vs. 16%, ns), and less time in the play/play state (4% vs. 36%, $F = 27.45$, $p < .0001$) than the nondepressed dyads. Therefore, children of depressed mothers seem to have more negative emotional states than children of nondepressed mothers, and this could affect their schemata of self and the world by encoding concrete images of negative interaction.

Overall, this is a good study. However, one weakness of it is that depression was measured on BDI criteria alone. A clinical interview would have given a more clear diagnosis of depression.

In an early study, Weissman, Paykel, and Klerman (1972) found that the care for newborns was significantly affected by their mothers' depression.

They found that depressed mothers tended to feel helpless and overwhelmed by the demands put on them by the newborn. The depressed mothers seemed to have unreasonably high standards for themselves and the babies and tended to become overindulgent, compulsive, and overprotective. They tended to overfeed the infants as well as feel anxious about whether or not they should hold the baby. Some mothers even expressed hostility toward the babies, and two mothers had previously tried to choke their babies during depressive episodes.

This study also found that as the children left the postpartum stage, depressed mothers continued to be overprotective and would either overindulge the children or not give them enough attention. Again the energy of the mother was focused on herself, depriving the child of needed attention. Maternal depression early in a child's life brings in many negative emotional experiences through one-on-one interactions which become part of the foundation of future schema development. Emotional experience is internalized during the process of schema development and, if not altered in some fashion, will continue to serve as a behavioral guide. The child may grow up to conclude that all relationships involve one person getting needs met and the other one not.

Attachment

Attachment and attachment behavior are primary concepts of the theory of John Bowlby. Bowlby (1969) defined attachment behavior as any

form of action that results in a person being in close proximity to some other particular person. This behavior could range from a mother holding an infant to adults making eye contact with each other from different sides of a room. Attachment, on the other hand, is the mental model (schema) of the relationship plus the affective bond between the two people (Guidano & Liotti, 1983). The propensity to attach, according to Bowlby (1969), is rooted in the biological nature of human beings and is like an instinct. Attachment is made up of very intense emotional experiences. When this instinct is thwarted, or if the outward connection is broken prematurely, anxiety, sorrow, or anger occurs (Klein, 1987).

There are four types of attachments: secure, anxious, defended, and coercive (Teti et al., 1995). The secure attachment of a toddler is demonstrated by his or her ability to directly express feelings, plans, and needs to attachment figures. Toddlers with secure attachments also share the responsibility of regulating their emotions, and they can negotiate the way separations and reunions are handled. For example, if a parent leaves a child with a babysitter, a securely attached toddler can communicate that he or she does not like it by either telling the parent so with his or her limited but effective use of language, or by some behavior such as crying. When the parent does depart, the child will usually give the parent a hug and a kiss beforehand. In other words, the child has some choice in the way the separation is conducted.

The toddler who is attached in a defended manner organizes behavior with a low probability of involvement or confrontation. He or she minimizes emotional displays and focuses on toys rather than the mother-child relationship. A toddler with a defended attachment generally takes on most of the responsibility for managing emotions, and separations are typically not negotiated. For example, if a parent leaves this toddler at a day-care facility day after day, upon entering, the child will consistently focus on the toys available while ignoring the parent, even if the child is angry about the separation. The child's negative feelings about the separation are generally not received by the parent, and the child must handle those feelings without help from the parent (Teti et al., 1995).

The coercive attachment is characterized by the child's maintaining access to the mother through threatening, angry, or feigned helpless behavior which coerces the attachment figure into meeting his or her needs. The toddler is preoccupied with unmet needs and gives the mother very little time to relax and attend to other responsibilities or relationships. Separations in this dyad may be negotiated but are typically left unresolved (Teti et al., 1995). A child with a coercive attachment, when left with a babysitter or at a nursery facility, will cry and scream relentlessly; the parent will be unable to console the child. The child will continue to scream after the parent leaves, and the parent will feel frustrated and angry. The situation will be left unsettled.

Teti et al. (1995) examined 104 mother-child dyads (61 depressed, 43 non-depressed) for the relationship between maternal depression and attachment security of the children. Mothers were recruited from therapists and newspaper advertisements. The mothers' ages ranged from 18.5 to 45.4 ($M = 30.27$, $SD = 5.42$); the infants' ages ranged from 3 to 13 months ($M = 7.16$, $SD = 2.74$). Most of the mothers had completed at least 12 years of school ($n = 82$) and most were married ($n = 85$). Mothers with bipolar disorder, substance abuse, and acting out personality disorders were excluded from the experiment. Of the 61 depressed mothers, 71% of them were diagnosed with major depression, 16% with dysthymia, and 13% with various adjustment disorders with depressive elements. Depression was measured by a clinical interview and the BDI. BDI scores for the depressed group reflected a moderate to severe level of depression ($M = 22.75$, $SD = 10.73$). In the non-depressed group, the mean BDI score was 6.81 ($SD = 4.69$), which indicates a sub-clinical level of depression.

Telephone interviews were conducted with all mothers, then they were each visited three times within a one month period. During that time the BDI was administered as well as two subscales of the Parenting Stress Index (PSI), which measured how they felt about their children. A higher score was indicative of more feelings of stress. Maternal behavior was assessed by observing the mothers for 10 minutes during a feeding time and a free play time with Schelcore Toys. The mothers were rated on a 5-point Likert scale

according to maternal sensitivity, warmth, flatness of affect, and disengagement. Inter-rater reliability for the maternal behavior rating scale was computed by using Pearson and intraclass correlation statistics. The Pearson correlations among the raters ranged from .77 to .80 ($M = .79$) for the four ratings of the feeding interaction, and .67 to .80 ($M = .72$) for the four ratings of the free play interaction.

Approximately 13 months later, the depressed mothers were revisited in their homes and again given the questionnaires. Also at this time the mothers brought their children to the university to be videotaped, using the Strange Situation paradigm. Children over 21 months old were assessed according to the Preschool Assessment of Attachment (PAA). Chi-square analyses and one-way analyses of variance (ANOVA) were conducted to examine demographic associations. No relationship was discovered between security of attachment and maternal education, family income, and mothers' marital status. "However, Pearson correlations indicated that educational level and family income were inversely related to parenting stress at Time 1 ($r_s = -.24$ and $-.20$, $p_s < .05$) and Time 2 ($r = -.31$, $p < .01$ and $r = -.30$, $p < .01$)" (p. 370). In addition, depressed mothers were found to have lower annual incomes ($p < .01$), and were also more likely to be unmarried ($p < .05$).

In order to compare the non-depressed with the depressed group in terms of attachment styles, a 2×4 chi-square analysis (Depression x Attachment Classification) was performed. The results demonstrated that

children of depressed mothers were more predisposed toward insecure attachment than were children of non-depressed mothers $\chi^2(3, N = 50) = 12.92, p = .005$, for infants; $\chi^2(3, N = 54) = 8.92, p = .03$, for preschoolers. The predominant attachment style of the infants and toddlers of depressed mothers was coercive. Nearly 40% of the children with a depressed mother had a coercive attachment, while 29% fell into the insecure-other category, 19% were defended, and only 13% were securely attached. In contrast to the depressed group, almost 44% of the infants and toddlers of nondepressed mothers showed signs of being securely attached, 26% were defended, 22% were coercive, and only 9% were classified as belonging to the insecure-other group.

Attachment behavior in children of depressed parents appears to be negative. While the study by Teti et al. (1995) says nothing directly about cognitive schemata, it certainly has implications for the theory. Children who lack a satisfactory parental attachment may be at an increased risk for developing fatalistic or hopeless beliefs about themselves, others, and the world.

One of the strengths of this study was that depression was measured by the BDI and a clinical interview. Mothers with bipolar disorder, substance abuse, and acting out personality disorders were excluded. The control group appears to be non-ill. Therefore the statistical comparisons are more clearly contrasted between depressed and nondepressed individuals.

Brain Activity

During infancy, the child develops primary attachments which, as stated earlier, serve as one of the cornerstones of cognitive schema development. Another factor involved in schema development is the brain. Infants as young as 3 months old, with a depressed parent, show a significant difference in brain activity, when compared with infants with normal parents. The different brain activity is thought to be associated with certain types of behavior, such as shyness, withdrawal, and timidity (Field, Fox, Pickens, & Nawrocki, 1995). The frontal lobe is connected with various limbic structures which directly affect the control of emotion. The left frontal region is associated with emotions related to approach behaviors, such as joy and curiosity. This part of the brain is functional as early as birth and it grows rapidly during the first two years of life.

The right frontal lobe is the location in the brain that governs the expression of negative emotion. Adults with right frontal electroencephalogram (EEG) asymmetry are more likely to rate emotional video tapes as negative than adults with left frontal asymmetry (Field et al., 1995). Also, adults with elevated scores on the BDI (i.e., showing signs of depression) have been found to display a greater amount of right frontal EEG asymmetry (Field et al., 1995).

In children, right frontal EEG asymmetry has been found in those classified as fearful or anxious. Children of depressed parents appear to be

more fearful and anxious. Therefore, children of depressed parents may have a greater proclivity toward developing fear-based schemata.

Field et al. (1995) examined EEG asymmetry in young infants (ages 3-6 months) of mothers who were diagnosed with depression. The study focused on 32 infants, 3-6 months old, and their mothers. The mothers were all single, low income, and either depressed ($n = 17$) or non-depressed ($n = 15$) adolescents. They were recruited on a maternity ward shortly after the infants were born. To qualify for the depressed group the mother had to be diagnosable on the Diagnostic Interview for Children (DISC) and receive a score over 12 on the BDI. Also, in order to control for hemispheric specialization, the study only used infants of right handed mothers.

During the procedure, the infant was seated on the mother's lap while a researcher distracted the baby with a rattle. Another researcher then attached the electrodes to the infant's head. EEG and behavior were then monitored for 3 minutes. The researcher was unaware of the status of the mother's depression. At a separate time, the mother's EEG was recorded for 3 minutes.

EEG data were analyzed with the EEG Analysis System version 5.3. Data were unusable for 5 infants and 2 mothers because of interferences such as eye movements, muscle activity, and technical difficulties. The average number of artifact-free seconds was 111.0 for the depressed mothers, 99.3 for the nondepressed mothers, 60.0 for the infants of depressed mothers, and

62.9 for the infants of nondepressed mothers. EEG patterns were measured at various locations on the skull. Scores were computed by dividing the difference between right (R) and left (L) in a given region (either frontal or parietal) by the respective sum (R-L/R+L). A score of zero represents hemisphere equilibrium, a negative score represents relative right frontal activation, and a positive score represents relative left frontal activation.

An ANOVA revealed a main effect for group on the frontal laterality ratio scores. The depressed mother group had a more negative mean ratio score than the nondepressed group, $M = -.03 (.08)$ versus $.04 (.05)$, $F(1, 30) = 7.04$, $p < .01$. Nearly 60% (10 out of 17) of the depressed mothers were found to have relative right frontal activation, while only 20% (3 out of 15) of the non-depressed mothers did, $\chi^2(1, N = 32) = 4.98$, $p < .05$.

Similar ANOVAs were performed on the data from the infants. As with the mothers, infants of the depressed mother group were found to have a more negative ratio score than the infants of nondepressed mothers, $M = -.01 (.05)$ versus $.03 (.03)$, $F(1, 30) = 4.35$, $p < .05$. Of the infants of depressed mothers, 70% (12 out of 17) had relative right frontal EEG asymmetry, while only 13% (2 out of 15) of the infants of non-depressed mothers did, $\chi^2(1, N = 32) = 10.06$, $p < .001$. This indicates that, as early as three months of age, infants of depressed mothers show right frontal asymmetry.

Right frontal asymmetry has also been reported in infants with extreme temperamental patterns of fear and inhibition as well as in socially

withdrawn preschool children (Calkins, Fox, & Marshall, 1996). This EEG pattern is also thought to be a factor in the expression of negative emotion. Consistent right frontal asymmetry in infants of depressed mothers may be an important predictor of behavioral disorders in this group (Field et al., 1995). This type of brain activity may have a negative impact on schema development in children of depressed parents. Schemata of children of depressed parents may contain many negative beliefs and images of the world, self, and others.

Dawson, Klinger, Panagiotides, Hill, and Spieker (1992) investigated left frontal lobe activity and the emotions of infants of depressed mothers. The study included 21 female and 13 male infants and their mothers. Participants were recruited from a large sample of adolescent mothers, ranging in age between 15 and 21 ($M = 18.82$, $SD = 1.53$). The infants' ages ranged from 11 to 17 months ($M = 14.21$, $SD = 1.27$). Mothers' depression was assessed according to the Center for Epidemiological Studies Depression Scale (CES-D), a 20-item scale which yields a score of 0-60, with 16 or above implying the possibility of depression. Of the 31 subjects who completed the CES-D, 48.4% ($n = 15$) were found to be depressed.

Infants sat in a high chair and were exposed to a variety of conditions designed to elicit certain emotions, while mothers were instructed to speak only minimally, if necessary. The babies observed bubbles going up behind a black curtain, watched Sesame Street skits, and played peek-a-boo with their

mothers. Then, with the mother in her original chair, a stranger entered the room. The person walked silently toward the infant with neutral affect, loomed over the infant, and then left the room. All the while, mother maintained a neutral face. Then there was a break, and the mother played with her infant. At the experimenter's nod, the mother waved good-bye, walked slowly toward the door, stood for 10 seconds, and then left the room for 20 seconds before returning to comfort the infant. The EEG was recorded when mother reentered. The infants were videotaped for 5 minutes or until they were calm, whichever came first.

Affect was recorded according to a 7-point global affect scale, which ranged from marked distress to neutrality to laughter. Infant distress was measured on a 13-point scale, using infant vocalizations as indicators. Then the Ekman's Facial Action Coding System (EFACS) was used to evaluate specific instances of the infant's happiness, sadness, anger, disgust, and neutrality. Infant temperament was assessed according to the Infant Behavior Questionnaire which was filled out by the respective mothers (which implies that the mother's emotional state may influence the classification of the child's temperament).

The results demonstrated that as maternal depression increased, infants showed lower peak distress ($r = -.37, p < .05$) and increased latency to distress ($r = .37, p < .05$) during maternal separation. There were no differences in the types of negative emotions displayed; the only difference in

emotional behavior was that infants of depressed mothers showed more neutral expressions during the Mother Away scenario, $t(24) = -2.18$, $p < .05$, two-tailed.

Infant brain activity was measured during Peek-a-boo, Mother Away, and Mother Out scenarios. No differences were found at Baseline conditions. In a 4 (condition: Baseline, Peek-a-boo, Mother Away, Mother Out) \times 2 (depression) \times 2 (parietal vs. frontal brain region) repeated-measures ANOVA, a significant interaction between depression and condition was found, $F(1, 25) = 6.92$, $p < .01$. During the Peek-a-boo condition, significantly more left than right hemisphere activation was found in infants of non-symptomatic mothers, $t(13) = -2.51$, $p < .05$ (two-tailed test), than was found in infants of symptomatic mothers, $t(13) = .42$. In the Mother Out condition, neither group showed differential hemispheric activity, $t(13) = -.90$ for the symptomatic group, and $t(12) = -1.15$ for non symptomatic group. However, in the Mother Away condition, infants of depressed mothers showed greater left than right hemispheric interaction, $t(12) = -2.22$, $p < .05$ (two-tailed test), whereas infants of non-depressed mothers did not display any cross-hemispheric activity, $t(13) = .98$.

Children of depressed mothers at this age did not seem to be afraid of their mothers' being lost. This could be because the infants were already accustomed to their mothers' absences and their emotional systems were somewhat shut down. This apparent apathy may be a sign that children of

depressed parents have to behave as if they are more independent than they are capable of being. Their schemata seem to be oriented toward being alone with their emotions. In order to manage strong emotions, children of depressed parents must somehow reduce the intensity of their feelings. This may serve as a forced independence which may stunt the emotional development of these children.

Left hemispheric interaction in children of depressed parents appears to be an indicator of emotional withdrawal and apathy toward being left alone, while right frontal EEG asymmetry in infants of depressed mothers may be an indicator of an underlying schema that lends itself to fear-based activity. Thus, as early as 3 months of age, infants of depressed mothers may be at risk to develop a fear-oriented way of interacting and relating to the world. As they get a little older, the research indicates that children of depressed parents deal with their emotions on their own, rather than seeking help. The cognitive schemata of these children may therefore contain beliefs and convictions that they are on their own and that other people are not adequate or are unavailable to help them deal with emotion.

Brain research on children of depressed parents is relatively rare. The two studies sited here (Dawson et al., 1992; Field et al., 1995) are well done. However, since the research is relatively new, more studies of this nature should be done. The above research implies that children of depressed mothers are less emotional in the absence of their mother. This resonates

with Field et al.'s (1990) research, which focused on the parent and child's one-on-one interaction. Both point to the likelihood that children of depressed parents are unable to effectively communicate their struggle to their mothers, which leads to feelings of powerlessness and an attitude of hopelessness.

It is unclear at this time how much of the brain activity is attributable to genetics and how much to environment. Right frontal asymmetry and left hemispheric interaction are likely due to both a biological and a relational context. Genetic factors aside, an infant with a depressed parent is already having to deal with taxing stresses in the social environment that force the baby to make emotional adjustments.

Emotional Patterns and Regulation

Kochanska (1991) examined patterns of inhibition in children ages 24-42 months old. Participants were recruited from local day-care centers, parent groups, and the general public through newspaper notices and other advertisements. They were screened with the Schedule for Affective Disorders and Schizophrenia, Lifetime Version (SADS-L). The subjects were also diagnosed according to the Research Diagnostic Criteria (RDC). Thirty-nine mothers were diagnosed with no history of mental illness (20 girls, 19 boys), 32 had a history of major unipolar depression in the child's lifetime (15 girls, 17 boys), and 17 had a history of a bipolar illness (12 girls, 5 boys). The depressed women were classified into four different groups: (a) unipolar not recent ($n = 22$; 11 girls, 11 boys); (b) unipolar recent ($n = 10$; 4 girls, 6 boys); (c)

bipolar not recent ($n = 5$; 3 girls, 2 boys); and (d) bipolar recent ($n = 12$; 9 girls, 3 boys).

Each mother-child dyad was videotaped interacting in a laboratory, two-room apartment in different family contexts, such as meals, free time, and a visit of a stranger. Two particular interactions were chosen for examination in this experiment. The first was the initial 10 minutes upon arriving in the apartment, and the second was the first 5 minutes of the arrival of a stranger. During the stranger situation, a female stranger entered the apartment and attempted to engage the child in a conversation. Behavior was coded according to three general categories: (a) the child's proximity to the mother, (b) approach/withdrawal from the unfamiliar, and (c) mother-child interactions.

Total inhibition scores were created by taking the difference between the sum of all uninhibited behaviors. In addition, two analogous scores were created to test nonsocial and social inhibition. These three scores were used as dependent measures to test differences between the groups of mothers. Social and nonsocial inhibition were not significantly correlated in the normal group, nor in the bipolar group, but were found to be moderately correlated in the unipolar group ($r = .33$, $p < .05$). Univariate analysis of variance indicated that girls tended to be more socially inhibited than boys, $F(1, 81) = 3.63$, $p = .06$, and that boys were somewhat more non-socially inhibited than girls, $F(1, 82) = 2.83$, $p < .10$. Differences were found when the five groups were

compared. The Student-Newman-Keuls test ($p < .05$) showed that children of recently depressed mothers were more inhibited ($M = 26.32$) than children of any other group. The author does not justify a post-hoc test for an F that was over $p > .05$.

Kochanska's (1991) research indicated that children of depressed parents are somewhat fear oriented. Two other emotions that are primary during the early years of development in children of depressed parents are aggression and guilt (Zahn-Waxler, Kochanska, Krupnick, & McKnew, 1990).

Zahn-Waxler et al. (1990) studied children of depressed and well mothers in the early school years to see if there was a difference in the way children of depressed parents handled guilt. The sample included 52 children between the ages of 5 and 6 years old, and 35 children between the ages of 7 and 9 years old. The mothers were screened by the SADS-L and the RDC. Only mothers without a history of mental illness and those who were diagnosed with a major affective disorder (unipolar or bipolar depression) were accepted for the study. Thirty-five mothers were classified as well, 31 had a diagnosis of unipolar depression, and 21 had a diagnosis of bipolar depression.

Children were assessed by a psychiatric interview (Childhood Assessment Schedule, CAS) and a session in which they were administered a series of hypothetical situations with themes of interpersonal conflict and distress. A staff psychiatrist or psychologist asked the questions, all of which

could be answered "yes" or "no." Items were selected from the questions that had to do with self-blame or self-responsibility for negative events. There were 13 such items. For each item, a score was given, 1 if the child indicated no responsibility, 2 if there was possible responsibility, and 3 if there was a clear indication of guilt. The scores were then summed to give a total score of guilt.

In addition to the questions and the CAS, children were also read a series of narratives. The situations were hypothetical and open to interpretation. Structured questions were asked after the first two stories. The children's responses were coded according to the following emotional themes: (a) guilt, (b) empathy, (c) distress, (d) hostility, (e) concern about relationships.

The study found that older children expressed more guilt than younger children, $F(1, 79) = 14.43, p < .001$. Girls expressed more empathy than boys, $F(1, 79) = 5.93, p < .025$. Older girls were more empathic than younger girls (Duncan, $p < .05$, $M = 2.05$ for older girls, and $M = 1.24$ for younger girls) and older boys ($M = 1.19$). On the distress scale, older girls expressed more distress than boys ($M = 2.27$ and 1.72 respectively), $F(1, 79) = 8.81, p < .005$. No group differences were found in the hostility category. Girls expressed more concern over interpersonal relationships than did boys ($M = .79$ and $.38$ respectively), $F(1, 79) = 9.66, p < .005$. Girls of well mothers expressed more concern about relationships ($M = 1.11$) than did girls of depressed mothers

($M = .60$), boys of well mothers ($M = .41$), and boys of depressed mothers ($M = .30$), $F(1, 79) = 4.03$, $p < .05$.

The guilt and prosocial scores were combined to represent responsibility/involvement in another's distress. Analysis of variance indicated that the differences identified in children of depressed mothers and children of well mothers became more pronounced with age. There was a significant interaction effect with the age of the child and the diagnosis of the mother, $F(1, 79) = 20.55$, $p < .001$. Duncan's test revealed that younger children with a depressed mother showed more involvement in another's distress than did younger children of well mothers. However, older children of depressed mothers showed less involvement than older children of well mothers ($p < .05$).

Interrelations of the main themes in the narratives were examined to determine (a) how guilt related to hostility, empathy, distress, and relationship concerns, and (b) whether associations would differ as a function of gender or a mother's diagnosis. Guilt was associated with empathy and prosocial concern themes in children of well mothers ($r = .27$, $p < .05$) but not in children of depressed mothers ($r = -.13$, $p = ns$).

Children of well mothers were more likely to distort the narratives, $\chi^2(1, N = 87) = 10.43$, $p < .005$. Of the children of depressed mothers, 66% had at least one distortion in their narrative, compared with 27% of the children of well mothers.

The experience of growing up with a depressed parent appears to be one of defeat, powerlessness, and unworthiness. Eventually the children conclude that they cannot make a difference, so they seem to try less.

Radke-Yarrow, Zahn-Waxler, Richardson, Susman, and Martinez (1994) studied the emotional regulation of children of depressed mothers. They investigated toddlers' caring behavior toward the children's depressed mothers. They researched whether or not the uncontrolled nature of depressed mothers' affects would elevate or diminish rates of caring by small children.

The participants were 90 preschool-age children and their mothers. The mothers' diagnoses were based on the RDC and the SADS-L. Thirty-two of the mothers were diagnosed with major depression, 20 were diagnosed with bipolar disorder, and 38 had no current or past psychiatric disorders. The severity of the mother's depression was also a point of consideration. Twenty-five mothers (12 unipolar and 13 bipolar) were considered severely depressed, and 27 (20 unipolar and 7 bipolar) less depressed. The children were evaluated according to three different variables: (a) the attachment relationship, (b) the gender of the child, and (c) the child's own level of well-being.

The mothers and children were individually observed and videotaped over the course of three days in a comfortable apartment setting designed for research. The child's behavior was encoded according to (a) verbal or physical

sharing, (b) helping, and (c) comforting and caretaking. The first day the dyads were observed in a naturalistic setting with no specific rules or guidelines governing behavior. The next day the children and mothers were observed together and were instructed to look at some pictures of mothers and infants. Each picture expressed a different emotion. During the third day, the attachment relationship was assessed according to the Strange Situation procedure. The scores on caring behavior were the separate sums of all prosocial acts in the naturalistic and experimental settings. Pearson correlations, analysis of variance, and post-hoc comparisons were used to evaluate the data.

There was a significant two way interaction between attachment and gender, $F(1, 82) = 3.95$, $p < .05$. The results showed that securely attached girls expressed more concern ($M = 1.83$, $SD = 1.97$) than the securely attached boys ($M = .83$, $SD = 1.30$) and the insecurely attached girls ($M = .75$, $SD = 1.20$) and about the same amount of concern as insecurely attached boys ($M = 1.63$, $SD = 2.34$). When considered in light of the severity of the mothers' depression, boys with severely depressed mothers showed significantly higher rates of caring behavior ($M = 2.78$, $SD = 2.86$) than the boys of well or less depressed mothers ($M = .83$, $SD = 1.30$). Also, the rate of caring in boys of severely depressed mothers was higher than in the girls of depressed mothers and higher, but not significantly higher, than in girls of well or less depressed mothers. This could mean that maternal depression has a cross gender effect

and influences boys to behave in a way that is not typical of boys in general.

Up to this point it has been demonstrated that children of depressed mothers experience dissatisfaction in one-on-one interactions with their mothers. In addition, they lack efficient coaching from their parents that would enable them to deal with issues such as completing challenging tasks and resolving conflict. This unsatisfying interaction with parents has a negative effect on the attachment and the attachment behavior of children of depressed parents. The brain activity of children of depressed parents has also been shown to be different than that of children of non-depressed parents. And children of depressed parents appear to have more difficulties with emotions such as anger, guilt, and fear. It appears, then, that the cognitive schemata of children of depressed parents are more negative and fear-based than those of children of non-depressed parents.

Play Age Children

During the play age (5-12 years), a child's social world begins to broaden greatly. This is a period of development in which earlier established convictions and beliefs about the self, the world, and others are reinforced or altered in some manner. The infant's social world consists primarily of mother and infant and, in many cases, father. During the play age, the child's world expands to include not only parents but family members, other children, and teachers as well. Thus, while a mother may still be the most

influential person in the child's life, she is not the only strong influence. Furthermore, the child at this age has a more defined sense of self and is influential in his or her own behavior as well as the behavior of others. Therefore maternal depression becomes less direct in influence on children in this stage, but still plays an important role in the development of cognitive schemata because it is still influential in the relational environment of the child.

It appears that such things as marital discord, separation or divorce, and critical statements by parents are more of an indicator than parental pathology of difficulties in children at this stage (Downey & Coyne, 1990; Emery, Weintraub, & Neale, 1982). However, it also is possible that parental pathology is a contributor to a poor marriage and parenting difficulties (Downey & Coyne) which, according to Emery et al. , are indicators of negative school performance in children. Therefore maternal depression is a factor in a play age child's schema development, but not as directly as when the child was an infant or toddler.

It might seem that children of depressed parents would behave more helplessly than other children. Nolen-Hoeksema, Wolfson, Mumme, and Guskin (1995) attempted to measure helplessness in children of depressed and nondepressed mothers. They defined learned helplessness according to the following criteria: (a) low levels of persistence and enthusiasm with high levels of frustration during unsolvable tasks, (b) giving few adequate

problem-solving responses to everyday problems that were presented to the children in a one-on-one interview, and (c) teacher ratings of the children's tendencies to display learned helplessness and low competence in the classroom. They hypothesized that depressed mothers would demonstrate more hostile and critical behavior toward their children during difficult problem solving tasks. Therefore the child's motivation and ability to solve the problem would be interrupted, and he or she would then display helpless behavior.

Each mother-child dyad was videotaped while given a solvable problem which was then followed by an unsolvable one in order to see what the behavior was like during a frustrating situation. The characteristics of the mothers' negative behavior was coded according to (a) their level of intrusiveness, (b) the amount of negative content in their overt statements, and (c) their levels of hostility or irritability. Their positive behaviors were coded according to (a) their skill at encouraging mastery in the children, (b) the amount of positive content in their overt expressions, and (c) their level of expressed enthusiasm.

The mothers' negative affect and intrusiveness was highly correlated with a decrease in the children's enthusiasm ($r = -.35, p < .01$) and persistence ($r = -.38, p < .01$), and an increase in frustration ($r = .28, p < .01$). If the mothers encouraged mastery and showed positive affect, the children then showed more enthusiasm ($r = .36, p < .01$) and less frustration ($r = -.31, p$

< .01). Children with fewer adequate problem-solving responses during the interview were the ones whose mothers showed more intrusiveness ($r = -.39$, $p < .01$) and negative affect ($r = -.20$, $p \leq .01$). These children also were rated by the teachers as less competent and more helpless ($r = -.67$, $p < .01$). However, there was no correlation between the mothers' being intrusive and displaying negative affect with mothers' depression. Yet, children whose mothers were suffering for prolonged periods of depression were found to be less persistent and more frustrated ($rs = .47$ and $-.47$, respectively, $ps < .05$). Overall though, children of depressed mothers were found to be no more helpless in their behavior than other children their age. Nolen-Hoeksema et al. (1995) conclude that what leads to learned helplessness in children is the extent to which depressed mothers' behaviors toward their children are impaired.

Three other symptoms often associated with depression are an external locus of control, low self esteem, and anxiety. Hypothetically children of depressed parents could see themselves as being out of control, less than worthy, or at risk for danger. Politano, Stapleton, and Correll (1992) attempted to measure the differences in these three characteristics in play age children of depressed versus nondepressed mothers. No differences were found between children of depressed parents and children of nondepressed parents on the locus of control measure.

However, children of depressed parents showed a greater amount of trait anxiety and lower self esteem than the children of nondepressed parents. After analyzing the trait anxiety, Politano et al. (1992) concluded there was an underlying fear component apparent in the answers of the children of depressed parents. This is in line with the results of Kochanska's (1991) study that found children of depressed parents to show a stronger pattern of inhibition than children of well mothers.

One of the things that may perpetuate a fear-based schema in children of depressed parents is the tendency of depressed mothers to be more critical of their children. This contributes to lower self-esteem in the child (Goodman, Adamson, Riniti, & Cole, 1994). Goodman et al. selected 39 mothers and their children between the ages of 8 years, 2 months and 10 years, 9 months. Nineteen of the mothers had no history of mental illness, and 20 met criteria for having at least one episode of unipolar depression. The depressed mothers had a mean BDI score of 12.97 (SD = 8.3).

The children's self-esteem was measured with the Self-Perception Profile for Children, which is a 36-item profile that yields subscale scores on five dimensions: (a) Scholastic Competence, (b) Social Acceptance, (c) Athletic Competence, (d) Physical Appearance, and (e) Behavioral Conduct, as well as a score for Global Self-Worth. Each of the 36 items is scored from 1 to 4. The higher the score, the greater the competence.

Mothers were asked to describe their children in both positive and negative terms and, as a group, expressed a mean total of 14.36 positive attitudes, .52 affective-negative attitudes, 6.38 descriptive negatives, and 29.33 non-affective attitudes. Significant differences were found between mothers with a history of depression and well mothers, on the descriptions that were affectively-charged negatives ($t[37] = 2.17, p < .05$). Depressed mothers had more affectively-charged negatives when compared with well mothers ($M = 5.89, SD = 5.18$ vs. $M = 1.11, SD = 2.08, p < .001$), were more critical and hostile ($M = 2.35, SD = 3.04$ vs. $M = 0.35, SD = 0.91, p < .01$), did more self-blaming ($M = 1.77, SD = 2.67$ vs. $M = 0.65, SD = 1.70, p < .005$), and showed more maternal over-involvement ($M = 1.77, SD = 3.32$ vs. $M = 0.10, SD = 0.46, p < .05$).

An analysis of variance revealed a significant main effect of the use of affectively charged negatives for four of the five self-esteem domains: Social Acceptance, $F(1, 38) = 4.99, p < .05$; Athletic Competence, $F(1, 38) = 5.45, p < .05$; Physical Appearance, $F(1, 38) = 9.46, p < .01$; and Behavioral Conduct, $F(1, 38) = 38.29, p < .001$. For the Global Self-Worth profile, both affectively-charged negatives ($F[1, 38] = 45.91, p < .001$) and maternal depression ($M = 2.77, SD = .59$ for children of depressed mothers; $M = 3.46, SD = .47$ for children of nondepressed mothers) were significant main effects, $F(1, 38) = 9.64, p < .01$. Furthermore, post-hoc comparison tests revealed that children of depressed mothers whose mothers used one or more

affectively-charged negatives had a significantly lower Global Self-Worth score ($M = 2.44$, $SD = 0.26$) than those whose mothers used no affectively-charged negatives ($M = 3.55$, $SD = 0.33$).

Goodman et al. (1994) suggested a hypothesis that depression impairs parenting skills; also, that there is an association between lower self-esteem in children and negative evaluations expressed by mothers.

Goodman, Brogan, Lynch, and Fielding (1993) found some differences in the self-esteem and social competence in children of depressed mothers, but only in older boys (ages 8-10) who showed more difficulty managing their impulses, delaying gratification, resisting temptation, reducing impulsivity, and using words to control motor behavior than any other group. In addition they were found to be less resilient in dealing with failure than girls of depressed mothers and both boys and girls of nondepressed mothers. There appears to be a great deal of tension between depressed mothers and their sons, and the boys seem to elicit criticism from their mothers by their behavior (Ge, Conger, Lorenz, Shanahan, & Elder, 1995).

From ages 5-12, a child's world broadens greatly. There are more variables influencing self-esteem and behavior. As children get older, they are not only influenced by marital discord and parental pathology, they also influence those who influence them. The older they get, the greater the role children of depressed parents play in the development of their own psychopathology.

Conclusion

This paper reviewed theoretical material on schema development and empirical research on children of depressed parents. The theoretical review suggested that children's cognitive schemata develop out of their attachment with primary caregivers and early relational experiences with their mothers and other family members. The empirical review suggested that children of depressed parents experience an impoverished relationship with their mothers and, therefore, a breakdown in attachment. Research seemed to imply that an attachment does occur in these dyads, but is often painful for both parties. The brain studies suggested a biological element that affects emotional development and that, as early as 3 months old, children of depressed parents begin to be fear oriented. This tendency toward timidity seems to continue throughout childhood. Other characteristics of children of depressed parents are low self-esteem, negative beliefs about the world, and emotional detachment.

Since parental depression affects attachment, the overall relational environment, and one's biology, it appears to be a logical conclusion that cognitive schemata in children of depressed parents must be affected as well. However, it is a conclusion difficult to support with empirical research because of the elusive nature of schemata conceptualized as mental governors. What can be said is that maternal depression appears to influence the development of a fear-based schema in children.

Ryle (1949) cautions that there are pitfalls encountered when trying to apply the same descriptive terminology to the mental world as to the physical world. Nonetheless, the term cognitive schemata has been demonstrated to be an effective descriptive term for operationalizing a dimension of mental functioning. This dimension of functioning has been shown to have a strong impact on behavior. The relational environment has been shown to have a strong impact on the mental processes of children of depressed parents.

While the focus of this paper has not been clinical, at least one implication for therapy can be stated: Since cognitive schemata develop out of one's relational experience, clinicians should consider treating the family as well as the child of a depressed parent. Marital therapy is an option for the depressed parent (Beach, Whisman, & O'Leary, 1994). Adult children of depressed parents may seek treatment for a variety of symptoms. Clinicians should keep in mind that a longstanding, fear-based schema may affect functioning and that behavioral change will not occur without a relationship or a series of relationships that differ in quality from the relationship experienced with depressed parents.

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